

Preface

This issue of the *IBM Systems Journal* is devoted to papers that present the design considerations and the implementation of features that have expanded the capabilities of IBM's Systems Network Architecture (SNA). Since its announcement in 1974, SNA has been developed and refined to meet user requirements through enhanced networking and routing facilities and through new protocols that facilitate distributed processing and message switching.

With the growth of the use of intelligent nodes in computer networks, the opportunity to improve the efficiency of communications and the need to meet the unique requirements of the distributed-intelligence environment have resulted in the development of an Advanced Program-to-Program Communications Facility. Gray, Hansen, Homan, Lerner, and Pozefsky describe the design and implementation of this facility, which is a significant step in SNA's evolution as a distributed operating system.

As office systems and electronic document distribution make extensive use of communications facilities, the need for asynchronous data transmission support has become evident. Housel and Scopinich describe developments in meeting this need in their paper "SNA Distribution Services." This facility can result in improved transmission efficiency for the many applications that do not require synchronized transmission.

While multiple independent networks have been growing to meet the needs of a single enterprise, the need has arisen to provide for the transparent interconnection of these networks. Benjamin, Hess, Weingarten, and Wheeler describe the SNA Network Interconnection facility, which was designed to meet this need. Through the use of gateways that interconnect the networks, cross-network communication makes possible the accessing of application programs and systems in one network from terminals in another network.

As a part of its network service offering, the IBM Information Network (IBM/IN) makes it possible for user networks to attach to its network, thereby providing a variety of application development and network management services. In support of this capability, an experimental network interconnection facility was developed. Ryder describes the design and implementation considerations for this facility, which allows for enhanced communications between networks and the sharing of resources.

Recently IBM has announced an on-line interactive program called the Network Logical Data Manager (NLDM), which provides facilities for the detection and identification of errors associated with logical networks. Weingarten and Iacobucci differentiate between physical and logical networks in SNA and describe the network management facilities provided by NLDM for logical problem determination.

One of the challenges faced by all network managers is obtaining accurate data on the performance and availability of their networks. Without such information on user service levels and availability, the management of a large network may be more art than science. Bailey and Soucy describe innovative techniques used by the IBM Information Network to gather such data for use in ensuring that response time and availability objectives are being met.

Routing in an SNA network involves the specification of paths across physical facilities to be used for communication between logical units. Since the announcement of SNA, the interconnection possibilities have expanded from a single tree structure to a multisystem mesh to a multinet network topology. Jaffe, Moss, and Weingarten present the evolution of SNA's routing support as network complexity has increased.

With the evolution of SNA's routing capability, the task of specifying paths through the network has

increased in complexity. Maruyama discusses considerations for the creation of SNA routing tables and describes the design of a program called Routing Table Generator, which facilitates the specification process.

Satellite communications facilities offer the potential of communication that combines high bandwidth and low error rate. Because of the distances that messages must travel, propagation delays may limit effective use of the facility. Grover and Bharath-Kumar discuss the flow control problem imposed on SNA networks that utilize satellite communications facilities and present potential solutions to improve network utilization and efficiency.

As evidenced by the papers presented in this issue that describe new functions, IBM's Systems Network Architecture is evolving to support new directions in communications. By providing structured solutions to such requirements as network interconnection, asynchronous transmission, routing, and program-to-program communication, SNA ensures consistent and compatible implementations that facilitate data compatibility and interchange.

The editors wish to express their appreciation to Robert Weingarten for his contributions to the development of this issue.

John Lacy
Editor